FIG.1

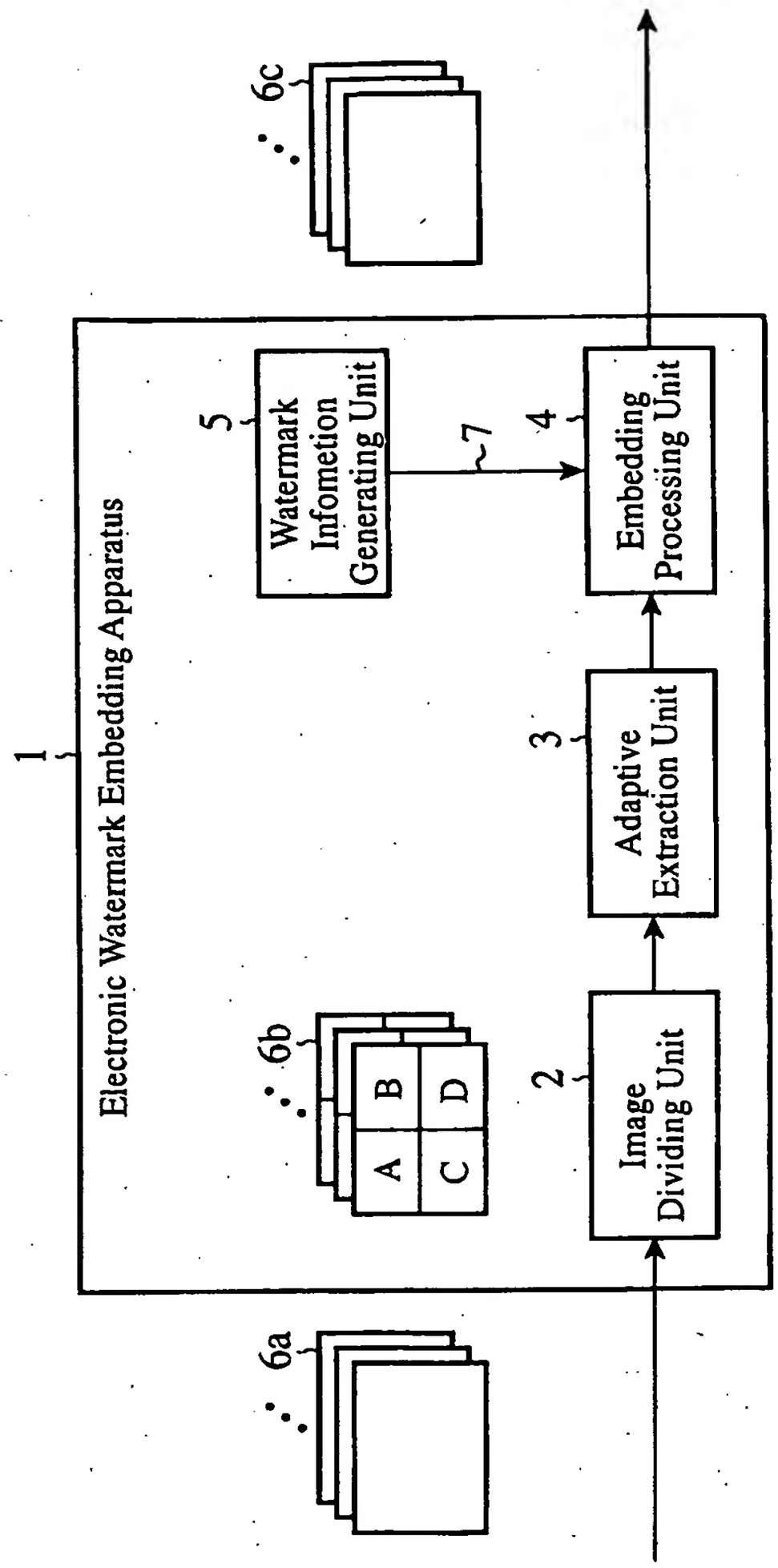

6c
Electronic Watermark Embedding Apparatus
1
5
Watermark Infomation Generating Unit
7
4
Embedding Processing Unit
3
Adaptive Extraction Unit
2
Image Dividing Unit
6b
A
B
C
D
6a

FIG.2

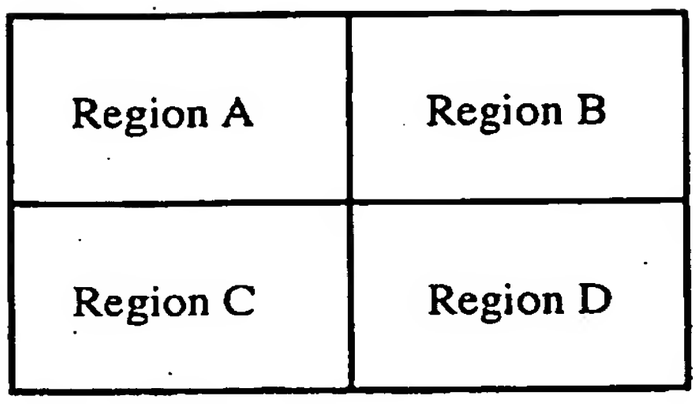

Region A
Region B
Region C
Region D

FIG.3

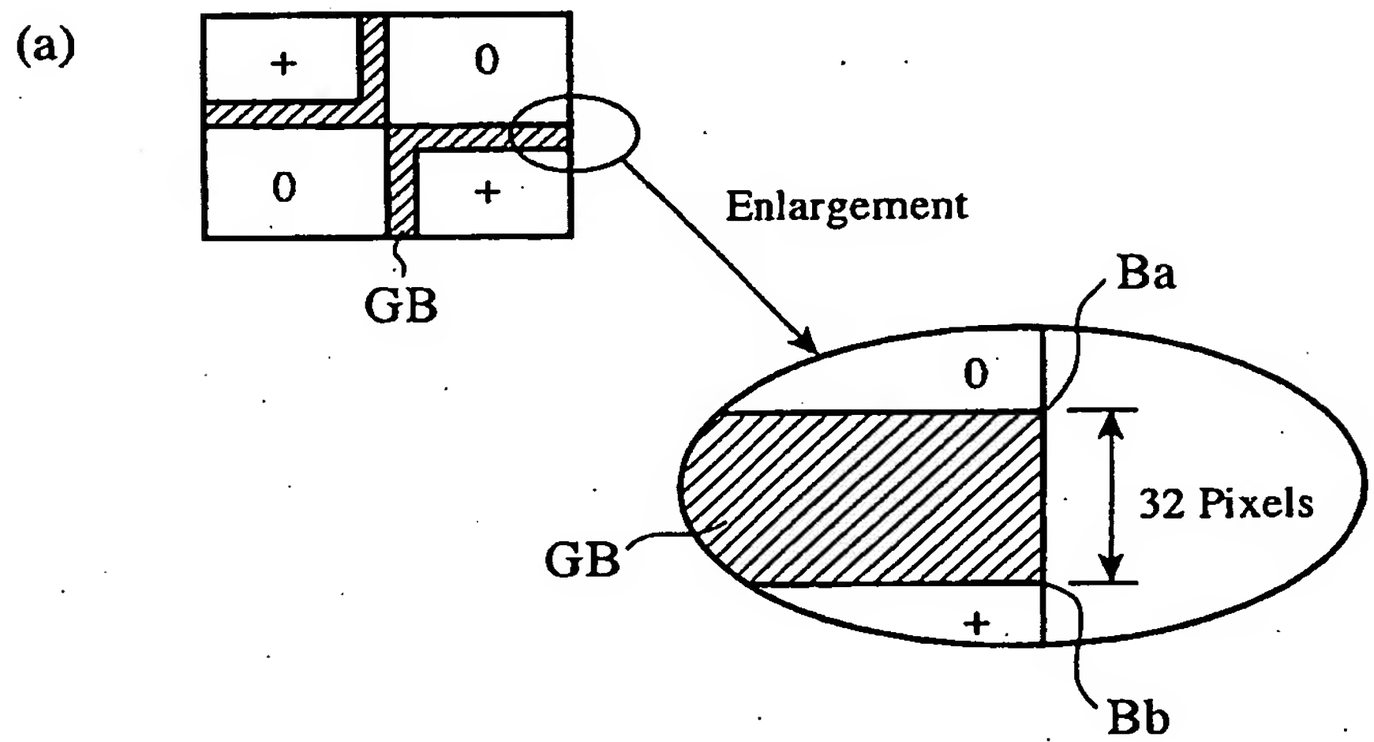
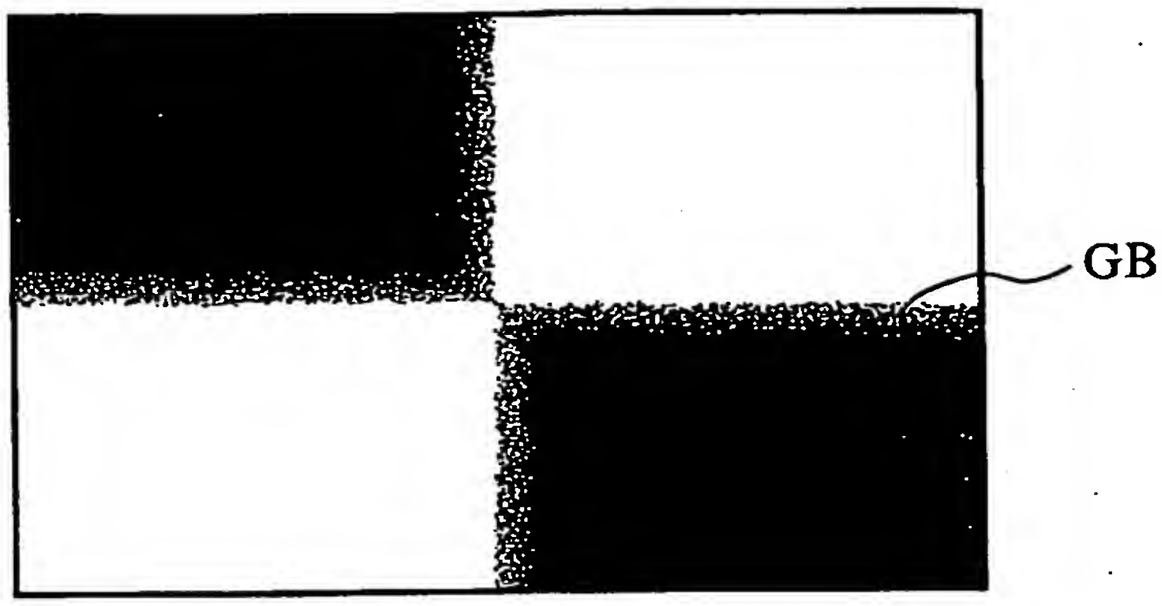

(a)
+
0
0
+
GB
Enlargement
Ba
0
32 Pixels
GB
+
Bb
(b)
+1
-1
10
15
25
30 Frames
Bc

FIG.4

(a)



(b)

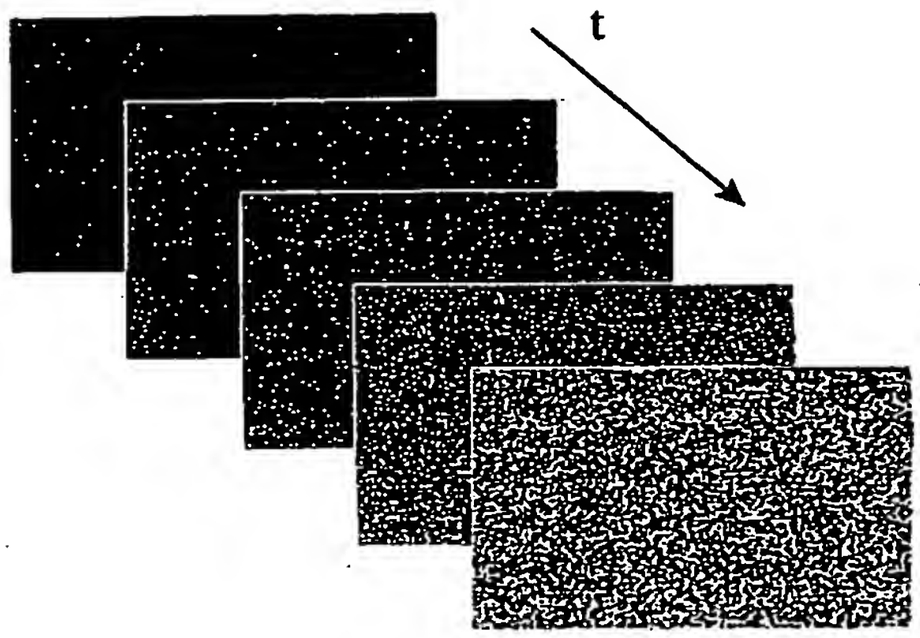


FIG.5

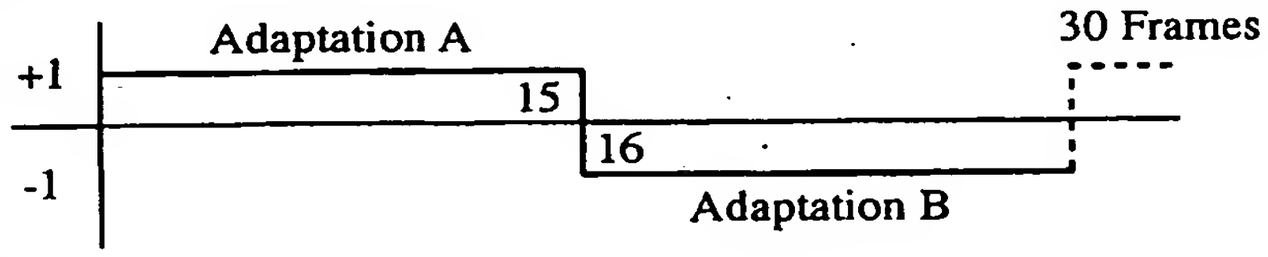
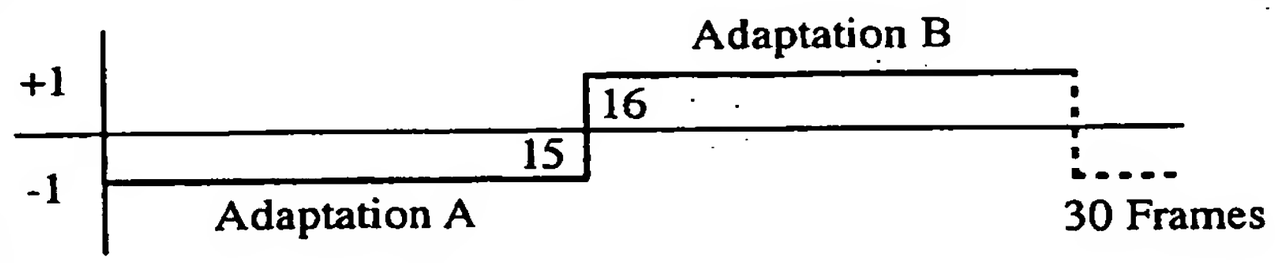
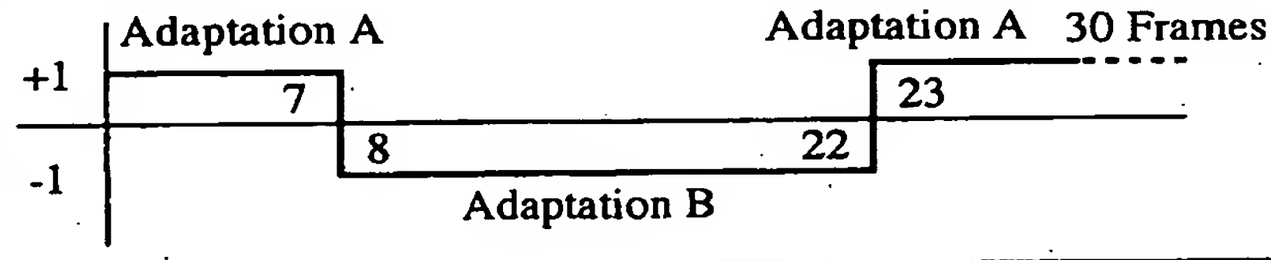
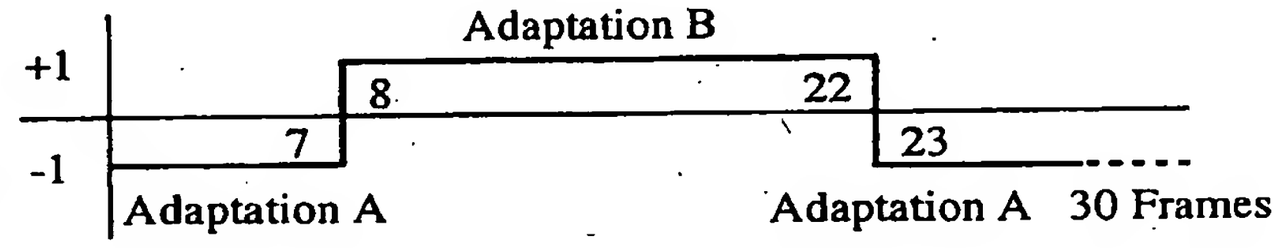
Embedded Bit Set	Embedding Period
00	
01	
10	
11	

FIG.6

Embedded Bit Set	Adaptation A		Adaptation B
	Brightness Value of 129 or More	Brightness Value of 128 or Less	Brightness Value of 180 or More
00	+1	Next 50% +1	+1
01	-1	Next 50% -1	-1
10	+1	Next 50% +1	+1
11	-1	Next 50% -1	-1

FIG.7

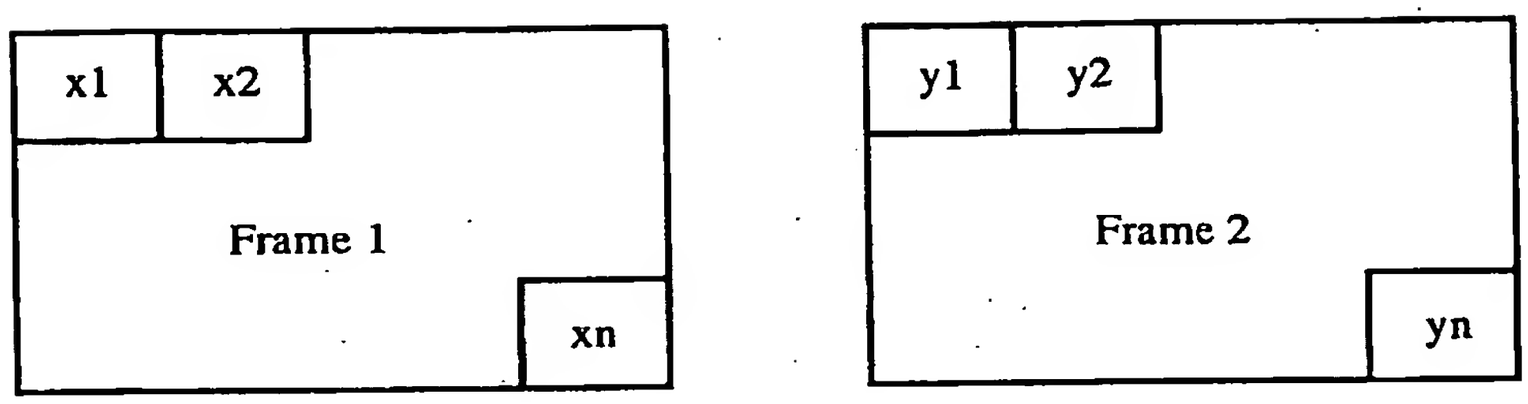
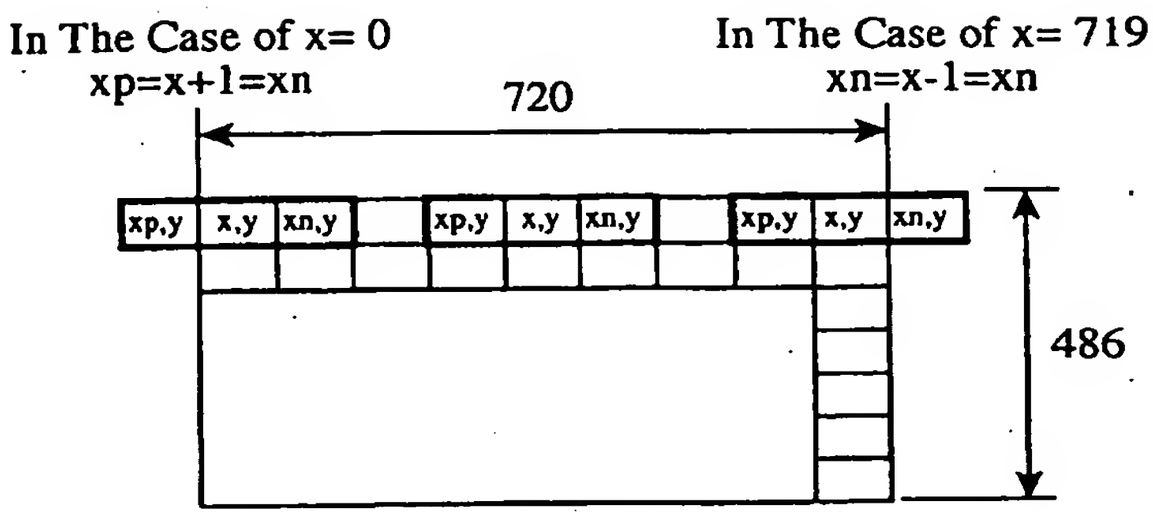


FIG.8

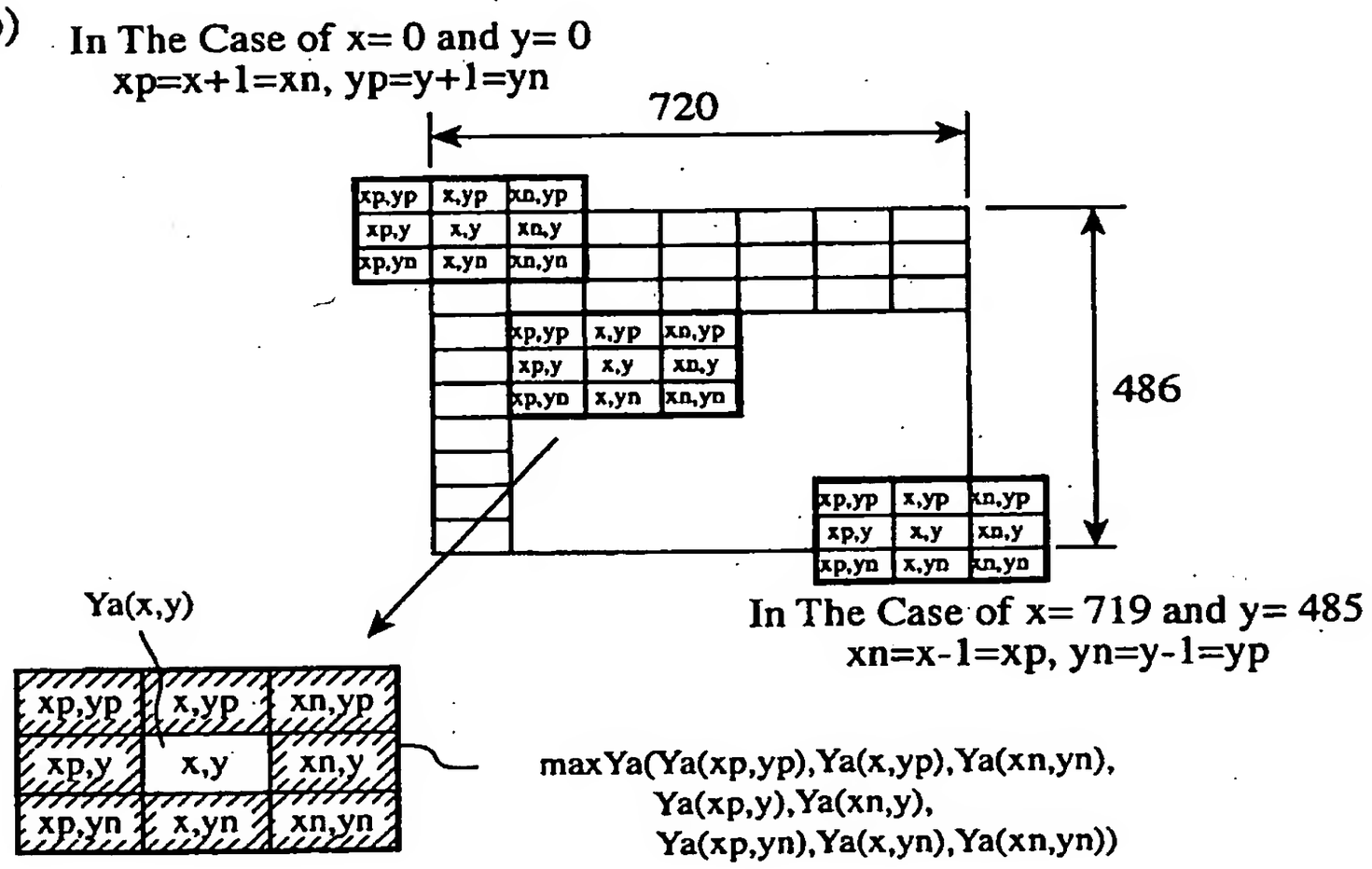
Embedded Bit Set	Frame Difference	Adaptation A		Adaptation B
		Brightness Value of 128 or More	Brightness Value of Less Than 128 Next 50%	Brightness Value of 180 or More / Brightness Value of Less Than 128 Remainder
00	≦2	+1	Null	Null
	3≦And ≦7	+1	+1	+1
	≧8	+1	+1	+1
01	≦2	-1	Null	Null
	3≦And ≦7	-1	-1	-1
	≧8	-1	-1	-1

FIG.9

(a)


In The Case of x= 0
xp=x+1=xn
In The Case of x= 719
xn=x-1=xn
720
xp,y
x,y
xn,y
486

(b)


In The Case of x= 0 and y= 0
xp=x+1=xn, yp=y+1=yn
720
xp,yp
x,yp
xn,yp
xp,y
x,y
xn,y
xp,yn
x,yn
xn,yn
486
In The Case of x= 719 and y= 485
xn=x-1=xp, yn=y-1=yp
Ya(x,y)
maxYa(Ya(xp,yp),Ya(x,yp),Ya(xn,yn),
Ya(xp,y),Ya(xn,y),
Ya(xp,yn),Ya(x,yn),Ya(xn,yn))

(c)

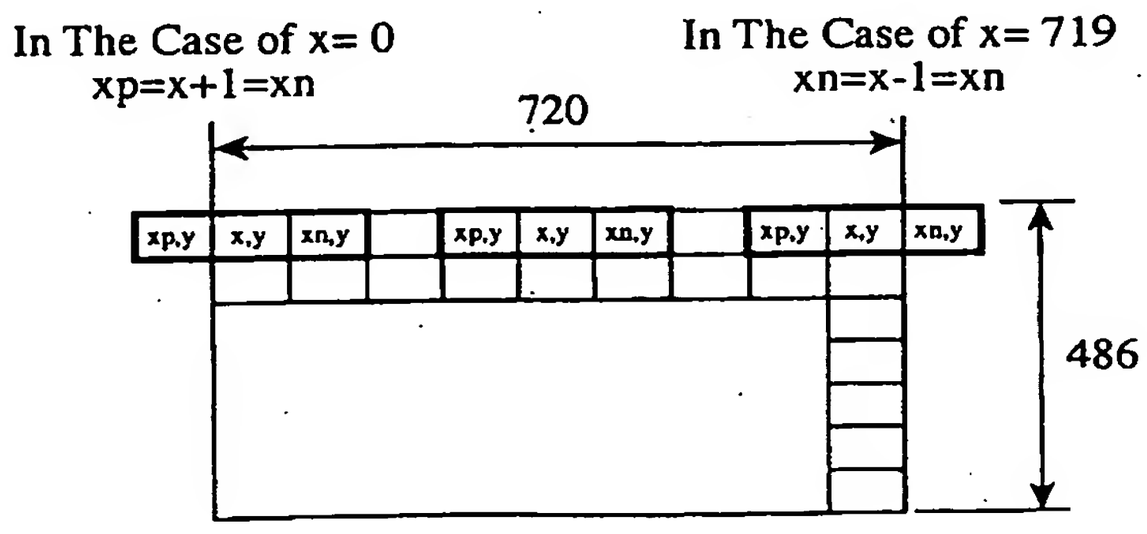

In The Case of x= 0
xp=x+1=xn
In The Case of x= 719
xn=x-1=xn
720
xp,y
x,y
xn,y
486

FIG.10

	Adaptation A		Adaptation B
Degree of Edge (Yc)	Brightness Value of Less Than 128	Brightness Value of 128 or More	Brightness Value of 180 or More
Less Than 10	Null	Null	Null
10 or More	Null	1	1

FIG.11

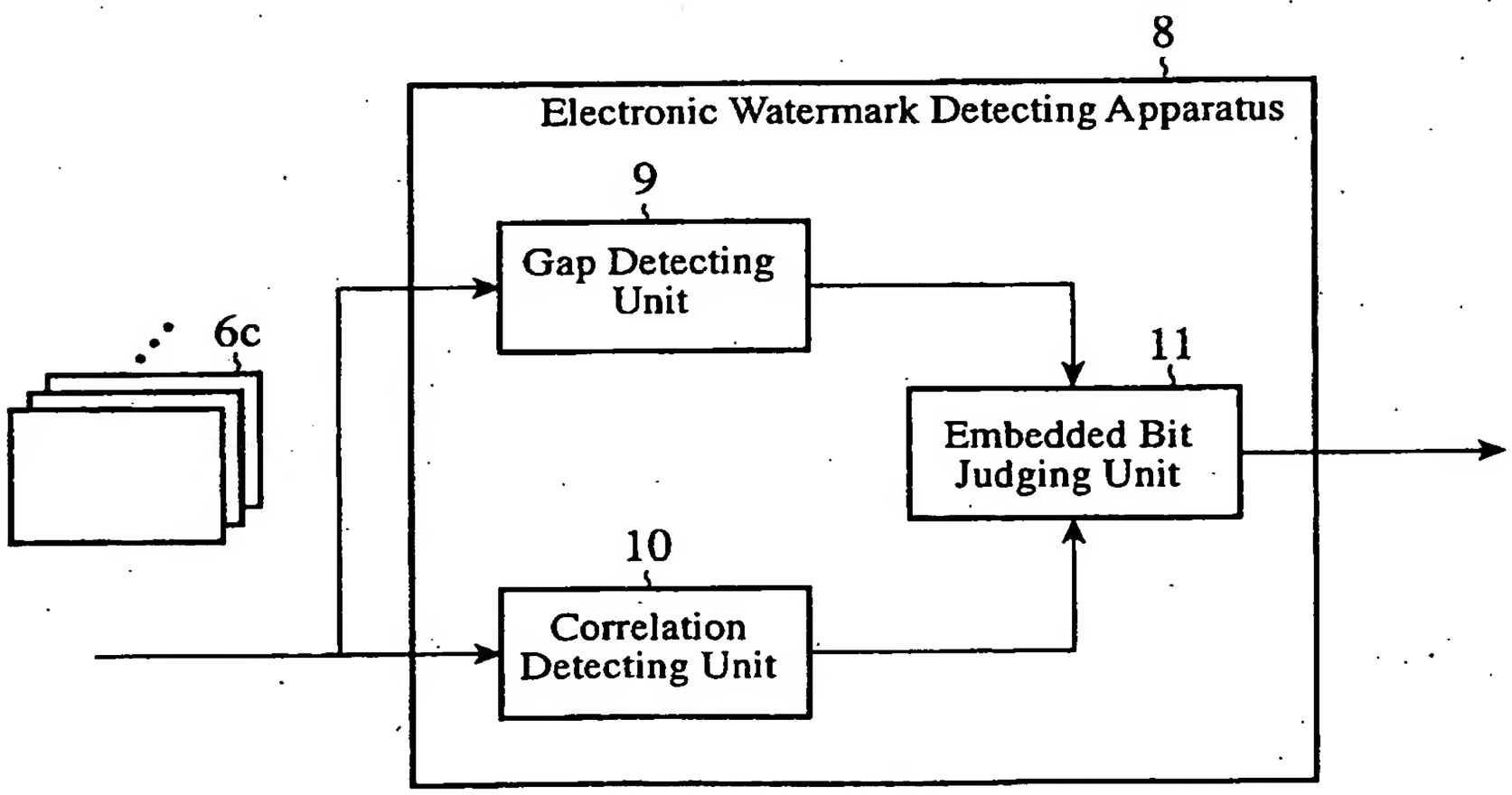


FIG.12

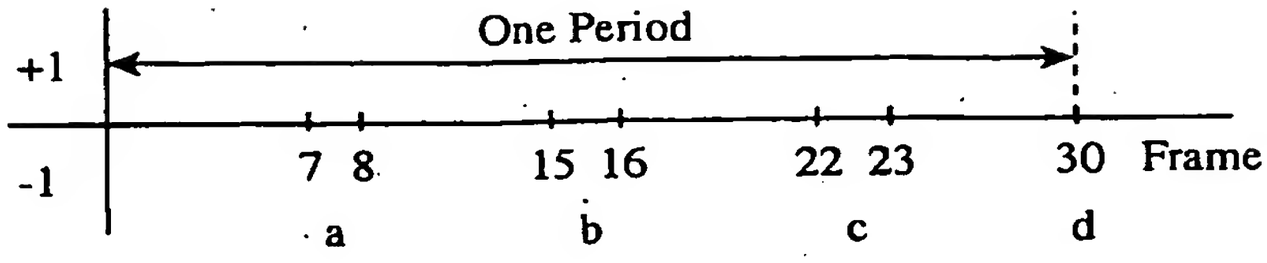


FIG.13

Embedded Bit Set	Gap_{ac}	Gap_{bd}
Not Detected	$\|Z\| < 0.1$ or $\|Z\| \times 2 \geqq \|X\|$	
00	Z	X
01	Z	-X
10	X	Z
11	-X	Z

FIG.14

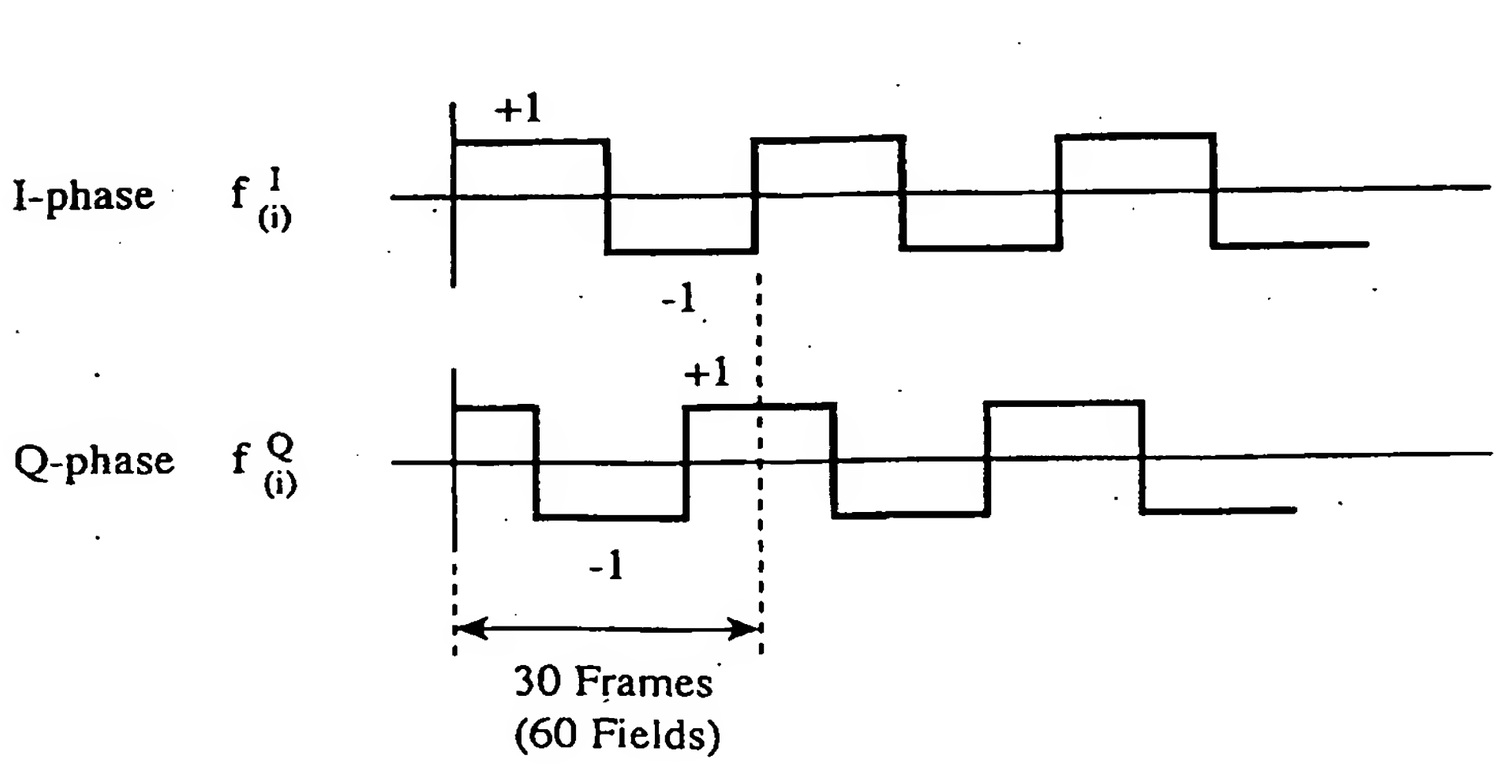


FIG.15

Embedded Bit Set	C(I)	C(Q)
Not Detected	$\|Z\|<0.1$ or $\|Z\|\times 2\geqq\|X\|$	
00	X	Z
01	-X	Z
10	Z	X
11	Z	-X

FIG.16

		Gap Detection				
		00	01	10	11	Not Detected
Correlation Detection	00	00	Not Detected	Not Detected	Not Detected	00
	01	Not Detected	01	Not Detected	Not Detected	01
	10	Not Detected	Not Detected	10	Not Detected	10
	11	Not Detected	Not Detected	Not Detected	11	11
	Not Detected	00	01	10	11	Not Detected

FIG.17

Gap And Correlation For Each Frame	Clip Value
$<$ -1	-1
$>$ +1	+1

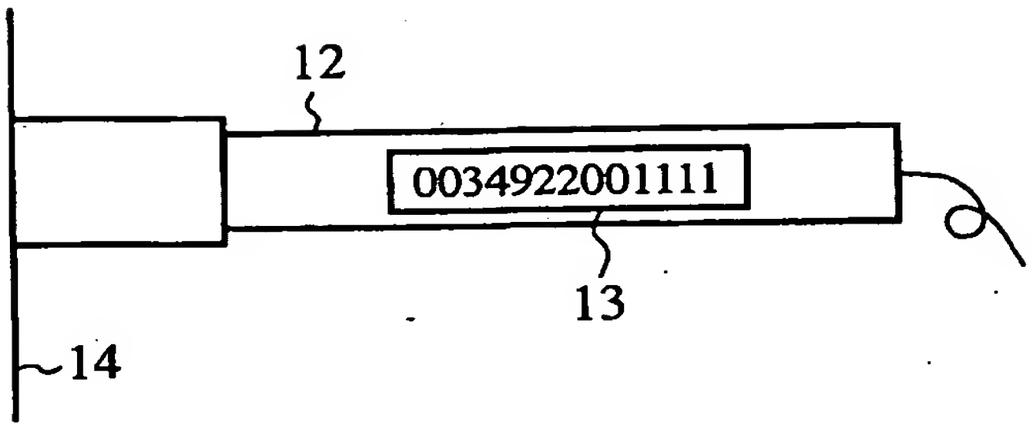



FIG.18